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ORIGINAL ARTICLES.

THE INSANE DIATHESIS—ILLUSIONS, HALLUCINATIONS AND DELUSIONS.*

W. BROWN IRWIN,† A.M., M.D., WERNERSVILLE, PA.

No description of the general forms of mental disease would be complete without reference to that condition of mentalization called the insane diathesis. To describe it would be difficult, for we find few cases of this condition alike, and its special manifestations are measured only by the differences in human faculties, and are as complex as the usual development of mental faculties can make it.

We find certain human beings characterized throughout life by certain peculiarities, eccentricities, originality in some useless way, oddities of manner, speech or dress, non-conformity to the rules that govern the great body of mankind, these things not amounting to mental disease in any correct sense, and yet being usually, by heredity, closely allied to it, or by evolution ending in it at last. Clouston says "no one has lived long in the world without meeting in the flesh many examples." Some of

these examples are strikingly original, a genius in some certain line of work or thought, yet in the ordinary affairs of life wanting in those traits that bring success. Nothing would be further from the truth than to say that all persons of the insane diathesis were geniuses or talented. Most of them are, on the contrary, a nuisance to their friends and useless to the world.

The insane diathesis is not always followed by insanity and those whom the world call peculiar may never meet with an exciting cause that will hurl them into an attack of mania or suicidal melancholia. That they possess a strong tendency toward insanity no one will doubt; yet no matter how strong that tendency may be they *may* live to a ripe old age, and have done much useful work, and enjoy to the end the reputation of an eccentric.

The only guide-board to the proper study of mental disease is a proper classification. To classify the subject properly is very difficult, since we have no absolute basis to begin with," no

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†Superintendent of State Asylum for Chronic Insane.

pathologic condition that we always find in a given class of cases.

Without taking any given form of mental disease let us review some of the characteristics that may be found in almost any case. The views taken by medical men and those held by the public in general regarding insanity are as diversely different as they well can be. The common idea of insanity pictures each patient as violently insane at all times, striking and abusing everyone who comes within reach, or as wildly and desperately suicidal, only seeking an opportunity to leave this earth and its endless round of trouble. If, on the other hand, the patient suffers from epilepsy he is not insane but only has "fits." Everything outside of these three divisions is generally designated by the word "crank."

Another aspect of the case is what may be called the legal, and this especially when relating to criminal cases, is narrow and incorrect. To be insane from this point of view the patient must be absolutely unable to tell the difference between right and wrong. The reason that we find fault with this view and say that it is incorrect is that we know that very many patients, in their most violent moments, know what they are doing and also know that it is wrong, yet are powerless to restrain themselves. When questioned after recovery their answer is "I knew it was wrong but I could not help it."

If a person's sanity is to be tested in court before the ordinary jury and you cannot prove he has delusions, or a very bad family history, you might about as well give up the case. The mind of the ordinary juror will not be impressed with any of the finer points that may be entirely sufficient to professional men. Juries, yes and even some of the judges of our courts, have no doubt in their minds that very many who are now confined in hospitals and asylums are wrongfully deprived of their liberty and should be released. Not until some such calamity as the assassination of the mayor of Chicago, about two years ago arises, does the popular feeling verge toward the other extreme and the demand is made that all cranks shall be locked up. If we could discover some happy medium between these two extremes to which

the public so often rush, it would be well.

But medical men and especially those of us who are in insane hospitals take a very different view of insanity and the insane than that held by those who have never seen the inside of such an institution and only draw their information from the highly colored and artistically decorated accounts found in the average newspaper. But leaving the views of the world at large to be what they may, let us look at insanity from our own standpoint, leaving the outside world to ponder over chains, torments, and dungeons, to their hearts' content.

In the majority of cases of insanity we may detect the presence of either *illusions*, *hallucinations* or *delusions*. In some cases these may be very hard to detect and their detection may take a long time and careful watching, yet they will generally be found, while in some few cases they will be found wanting. Because we do not detect them at first must not be taken as proof-positive that they do not exist, for many really very insane people are acute enough to hide their delusions for long periods of time and allow them to escape only by accident.

Delusions are very often looked on as the only conclusive evidence of insanity, and it is true that such evidence is beyond question; still, illusions and hallucinations are very often good indications of morbid mental states.

ILLUSIONS. An illusion is a false perception of a real sensorial impression: or, in other words, it is a misinterpretation of a real sense impression. Perception is the distinct consciousness of special sensations originating in one of the senses of sight, hearing, touch, taste, or smell.

In illusions the object that gives rise to the sense impression appears to the patient in very different characters from what it really possesses, and the aberration is by no means confined to any one of the special senses, but may be found in one or more than one at the same time. Perhaps the more frequent examples are found arising from the senses of hearing and sight.

By referring to the definition you will remember that an illusion was a *false perception*, hence, in order to the occur-

rence of an illusion, a real impression must be produced on the brain through some of the nerves of especial sense, but the impression appears in very different characters from those the object presents to the healthy brain. The nerves of sensation do their part faithfully and transmit the impression, but the brain being diseased it misinterprets the message. In most cases the impression comes from without and is carried to the brain by the nerves of sensation, yet, it may arise from one of the internal organs. For this reason we say that illusions are objective to the brain.

I, at one time, had a patient who, when lying in bed could see the ventilator in his room and firmly persisted that it was the picture of his father, and at the same time was much surprised that I could not see the resemblance. This is an example of an illusion of the sense of sight and, as in all others, we have a real sense impression, but a false perception.

Take for a further example a patient suffering from dyspepsia, who imagines he has a snake in his stomach, and you have an example of an illusion of wholly internal origin. A patient hearing voices commanding him to do or say certain things, where a rational being only hears the sound of the wind, is an example of an illusion of the sense of hearing. Examples of this kind might be multiplied indefinitely, but these few will suffice to illustrate my meaning.

The special external stimuli which are always present in illusions, and which act on the terminal organs of the special senses in the usual way, do not excite normal perceptions, as in health, but false perceptions that do not correspond to the external reality. So the ventilator in the wall appears to the patient as the picture of his father, and the noise of the wind is construed as voices of friends or enemies.

But the presence of illusions is by no means proof positive that the patient is insane. If he be able by his own will power and reasoning faculties to discover their falsity and correct them he must be considered sane. Thus if the patient to whom the ventilator appeared as his father's picture, can by his own reasoning power disprove the illusion, he must be considered sane in that respect.

In illusions then, whatever their origin, should the patient's reasoning enable him to discard them as false and unsound, he must be considered sane in relation to them. This condition frequently happens with illusions, but unfortunately seldom with hallucinations. — I, at one time, had a patient who told me he saw mice and rats running over the floor. When told that such was impossible he said, "I know it is, but the flies that are really there are rats and mice to me." This is a good example of an illusion corrected and proved false by the reasoning power of the patient himself, and of course does not amount to insanity.

As in this case we may occasionally find a patient who can correct one or more illusions and leave one out of which they cannot be persuaded by any amount of argument. The slight-of-hand performer and the ventriloquist calls his deceptions illusions, but such is not the case, for if our eyes and ears were educated sufficiently to follow the rapidity of motion and sound on which his deceptions depend, they would not deceive us at all. It has been related over and over again that thirsty travelers in the desert have experienced illusions of cataracts and the sound of rushing streams, when by thirst they have been so reduced as to be unable to correct, by their impressions of former experiences, what they see or hear, and they imagine that whatever reaches their sight or hearing must be the long hoped for relief of which they stand so much in need. It has been said that phantom ships have appeared to famished and exhausted sailors, and this has been poetized by Coleridge in his "Rhyme of the Ancient Mariner."

Whatever you may choose to call this state, it is a loss of the faculty of comparison, temporary perhaps, but nevertheless a loss, and in consequence the individual cannot be considered for the time being as of sound mind.

The form of illusion that attracts our attention most and is really very common is that of the sense of taste, which leads to the fear of poisoning and the refusal of food. Very many of the cases that require artificial feeding belong to this class, and, as you can well suppose, such delusions entail a great

deal of trouble and very materially detract from the patient's chances of recovery.

HALLUCINATIONS.—Hallucinations are false preceptions without any material basis. They are entirely new creations due to an abnormal condition of the brain itself. They arise when no impression has been produced on any of the nerves of sensation, and are equally independent of visceral sensations.

You will remember that when speaking of illusions I said that a *real* impression was necessary to their production, but such is not the case with hallucinations. They may be said to be *subjective* to the brain or baseless creations of the fancy. Like illusions, they may be of one or more than one of the senses, but are perhaps more frequent in those of hearing and sight.

Some authors have said that hallucinations of hearing are always a bad sign in insanity, and much worse than those of sight, and give as their reason that the former occur more frequently in chronic, while the latter are more common in acute cases. I see no reason to discredit this statement and think it will be found to be correct in the majority of cases that come under our observation.

As an example of this state of mentalization we might cite all those cases who hear voices or spirits where none exist and carry on conversation with imaginary friends or enemies. Very many of the patients who are constantly talking apparently to themselves are no doubt holding conversation with some imaginary friend and when questioned will answer evasively or not at all.

Another fact regarding hallucinations of hearing that is worthy of notice is that they are more common at night than during the day. We might expect that those patients who have "diffused hallucinations," or those who fluctuate from hour to hour, would be classed among the incurable ones, but the exact opposite is the case. Those are the most obstinate and unfavorable whose hallucinations are characterized by fixedness and constancy. One notable exception to this is in what is called "correlative hallucinations" of several senses, which when once firmly established are incurable because they con-

firm and support one another. Fortunately these cases are rare, yet we occasionally find them, and when found we only look at them as bearing one more stamp of incurability.

As I said before, hallucinations of hearing occur more frequently in chronic than in acute cases, and are more formidable. They are difficult, or impossible, to eradicate, and when they exist, render him who is afflicted the most dangerous of patients. Such patients eat, drink, walk, and act, according to the commands they hear, and if compelled to act contrary to them, they tell us they will suffer for such disobedience. They obey the voices implicitly, and often commit the most horrible crimes, never for a moment considering themselves as guilty or responsible.

What can be done with the patient who firmly believes he is commanded by God to take the life of his child and acts accordingly?

In chronic cases, or in those in which the insanity has revealed itself gradually and with few acute symptoms, hallucinations of hearing, form about two-thirds of all the cases we meet with. When a patient of this class tells us he or she hears "voices," not mere sounds, we expect an unfavorable case, our prognosis is gloomy, and our caution is that such a one requires close watching.

Illusions and hallucinations are often so closely linked together that they can be with difficulty separated. The only point of distinction is that in illusions there is a real presence justifying the false perception, while in hallucinations there is no such presence. The anatomy and physiology of these two classes of perceptions are in the main identical and may be treated together.

Take an illusion for an example; the image of the ventilator is impressed on the patient's nerves of sight and carried to the brain, but the brain being diseased, the image is presented to the patient's consciousness as the picture of his father. In this case the eye may be, and doubtless is, in perfect order, yet the brain image and the optical image are radically different.

Sensations arising in the brain are referred to the ends of the nerves, having their origin in that particular portion. In hallucinations of

hearing, the portion of the brain which presides over that function being diseased, the sensation is referred to the nerves in the ear, and the patient hears voices in the quiet of the night time commanding him to do or say certain things. Hallucinations of this kind would be just as common if the patient was deaf, blind, or wanting in any of the common senses.

With a little reflection you will notice it would be impossible for illusions to exist under the above conditions, however frequently it may occur with hallucinations, for with the former an external impression is necessary.

CAUSES. Inequalities in cerebral circulation, or changes in the quality of the blood, toxic substances as opium, alcohol, and many other agents; general anæmia, or whatever increases the irritability of the nerve centers; states of exhaustion from fevers, hemorrhage, or starvation, are all competent causes of illusion and hallucination. They may also arise from powerful emotion or from concentration of thought upon one subject.

Most all of us can recall cases of this kind where, by anxious parents, the least noise is construed into the cry of a sick child, or by the eager watcher into the approaching footsteps of the long expected one. These are examples of illusions but cannot be called insane ones, for the people experiencing them are able to correct the false perception of the senses and separate the true from the wholly imaginary.

DELUSIONS. An insane delusion is a false belief; the patient accepts his false perceptions as facts and no amount of reasoning can persuade him that his perceptions are false. Delusions have been ranked as the most important legal evidence of insanity, perhaps for the reason that they are better understood by court and jury. Every erroneous conclusion must not be called a delusion, for errors in judgment arise from imperfect knowledge and bad logic, and the premises may be imperfect though not false; the reasoning may be bad, but that does not imply disease, whereas, in delusions the premises are false though there may be no fault in the logic.

Numerous examples will be found where patients holding a faulty belief

cannot be reasoned out of it by any amount of argument. I need hardly say that the patient, who, on his arrival, confidently informs you that he is George Washington or Napoleon; or one, who, from the lower walks of life, yet wishes to present you with a hat full of diamonds; or one who insists she is the Lord Almighty; or one who says he is making angels, are each and all suffering from delusions. That the patient is delusional who constantly complains that her brain, liver, and stomach, are being cut to pieces by a man who has been dead for years, goes without saying.

Neither is it necessary that the delusions shall be expressed in words, for the actions of a patient often stamp them as delusional when they never reveal them by words. In this particular, delusions of grandeur are more marked than any other.

The melancholy patient who has never been heard to utter a word, is governed by his or her delusions; and in one case I remember the patient never spoke of them except when under the influence of chloroform for the reduction of a dislocated shoulder, produced by an unsuccessful attempt at suicide.

The peculiarities of manner which spring from overbearing self-conceit are the most striking and constant. The lunatic who has a delusion respecting his own mighty power and ability as a fighter will take the opportunity to show his powers, and much of the violence among the insane arises from this very common delusion.

The origin of delusions is very similar to that of illusions and hallucinations and may be treated in two classes; those arising *in the brain itself* and those *external to it*.

Among those arising in the brain itself may be enumerated disturbances of cerebral circulation, the use of poisonous substances as alcohol and opium, and from organic disease of the brain itself. Among the external ones are general irritation of the peripheral nervous system, local disease of the internal organs, and diseases of the organs and special sense.

Illusions and hallucinations are perhaps the most patent cause of delusions among the insane, for it is more difficult

for those experiencing them, than for persons in health, to discredit the evidence of their senses.

Delusions might be divided again, according to their nature, into *depressive* and *expansive, temporary and permanent, passive with a tendency to action, and active with a tendency to violence*. Each of these and many others might be treated separately.

Before going further let us view the definitions given above.

1. An *illusion* is a false perception of a real sensorial impression.

2. An *hallucination* is a false perception without any material basis.

3. A *delusion* is a false belief; the patient accepts his false perceptions as facts.

You might ask how are we to know that these peculiar notions are really delusions, when we remember that conversation and conduct might be perfectly proper and natural in one person, while in another, differently constituted, would indicate insanity. In determining the mental condition of an individual he must not be judged by any arbitrary standard of sanity or insanity, nor compared with those unquestionably sane or insane. He can properly be compared only with himself.

"When a person without any adequate cause, adopts notions he once regarded as absurd, or indulges in conduct opposed to all his former habits and

principles, or changes completely his ordinary temper, manners and disposition—the man of practical sense indulging in speculative theories and projects; the miser becoming a spendthrift and the spendthrift becoming a miser; the staid, quiet, unobtrusive citizen becoming noisy, restless and boisterous; the gay and joyous becoming dull and disconsolate even to the verge of despair; the careful, cautious man of business plunging into hazardous schemes of speculation; the discrete and pious becoming shamefully reckless and profligate—no stronger proof of insanity can be had."

And yet, not one of these traits, in and by itself alone, could be regarded as conclusive evidence of insanity. In accordance with this fact the principle has been laid down, with the highest legal and medical authority, that it is the prolonged departure, without any adequate cause, from states of feeling and modes of thinking usual to the individual, when in health, which is the essential feature of insanity.

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THE POND WILL CASE.—A MEDICO LEGAL STUDY.

T. D. CROTHERS, M.D.,* HARTFORD, Ct.

The late C. M. Pond, a prominent business man, left the city of Hartford, Ct., a large tract of land for park purposes, the value of which was over a hundred thousand dollars. The will was contested on the ground of incompetency and mental weakness from the excessive use of alcohol, morphine and chloral. Austin Flint, M.D., of New York, Allen McLane Hamilton, M.D., of New York, J. B. Mattison, M.D., of

*Superintendent Walnut Lodge Hospital.

Brooklyn, N. Y., Francis Bacon, M.D., of New Haven, Ct., were called as experts on the opposing sides. The case lasted five weeks and caused intense interest, and resulted in a verdict against the will. This was followed by an appeal and a new trial was ordered, which will take during the coming winter. The following review of the case will be of interest:

In the trial a number of very interesting questions were brought out, some

of which appear to be worthy of some detailed study. As in contested cases where medical men are grouped to favor opposing sides, the scientific facts suffer. Hence the statements of experts on the stand under the cross fire of lawyers, are misleading and often sadly misrepresent the intelligence and judgment of such medical men.

The facts accepted by both sides were, that for at least ten or fifteen years before Pond's death he had used spirits and morphine to excess. This had caused him to withdraw from active business, and there were marked changes in his conduct and character.

The question was, had his use of spirits and morphine been of such nature as to make him practically insane. This must be answered in part by a study of the amount used, and its effects on his conduct. In the first case there was no question that the amount of alcohol and morphine used was large and excessive especially at times, but the exact amount and the frequency of its use was in dispute. In the question of the effects of these drugs on the mind and conduct of the man, there was much difference of opinion.

The efforts to settle this, by cumulative testimony, in which the side with the greatest volume of evidence is assumed to be the truth, is a very unscientific way of ascertaining the real facts. The grouping of statements of witness who are ignorant of the facts in question or incompetent by personal interest is always dangerous and misleading.

The medical expert testimony sustained two exactly opposite views based on the same general evidence. One that it was impossible to be sane and rational while using spirits and opium to the extent asserted by the witnesses. The other side affirmed that from this evidence, no degree of insanity or permanent unsoundness of mind could be determined. The real point of dispute was the mental health and capacity of Mr. Pond to write or devise a will at a certain specified time.

In the long contradictory history of his habits and conduct, the opposing counsel sought to gather facts that would make a clear diagnosis of insanity, or to create a doubt of this, and

strengthen the supposition that he was mentally unimpaired. It is not my purpose to review this mass of evidence and point out its error and inconsistencies, but rather to examine some facts brought out which are not very clear to the profession. The common error that alcohol is a stimulant giving new power and force to the organism, and a narcotic in large and continuous doses, is a source of much confusion. A drug that will stimulate or narcotise, will rouse the heart or depress it, will create an appetite or diminish it, will build up tissue or tear it down, will check inflammation or increase it, will increase the power of organic resistance to poisons and disease, or diminish this power; in brief, a drug that has exactly opposite effects of the body at different times and in different conditions, is a pure fiction. Alcohol is a paralyzant and anesthetic with a distinct chemie and physiologic action on the organism.

Chemically it develops a ptomain, with fruitful soil for its growth and development. Physiologically it absorbs water from the tissue, corrugates and paralyzes nerve centres, cells and nerve fibres. After a certain period in the use of spirits, a peculiar toleration appears. The effects from four ounces of alcohol are not double those of two ounces. Beyond a certain point, the visible effects are not increased, no matter what amount is taken. The cumulative action of alcoholic ptomains may suddenly concentrate and produce stupor, coma or acute pneumonia and death. The fact of being able to take a pint or a quart of spirits daily, without stupor and coma, proves this toleration, and also intense activity of the eliminative organs, the kidneys, skin and lungs, to throw off poisons. The brain is anesthetized; that is, its activities are diminished and reduced to a low level. All impressions from the senses are deranged, capacity to formulate such impressions and adjust them to conditions of the present are equally lowered. No man who uses spirits to excess is able to devise or originate any new line of thought or action.

He may invest some previous conception of act or thought, with a delusive glare that to the thoughtless, seems original. No man who uses spirits to

excess can materialize the impressions and influences of others, except at the present time. Later they will fade away and cannot be utilized. No man under the influence of spirits can be made to commit a crime to-morrow, or write a will or sign a paper at the direction of others, unless done at the present time. If it is done, it must be at once when the suggestion is made, and when the idea fills all the present of mentality. The power of retaining a mental conception started in an alcoholic anesthetic brain grows more and more feeble, until it is practically lost. Wills written or acts performed by persons who use large quantities of spirits always show the mental condition of the actor, especially if the act was devised in some defective condition of the present.

If the acts had been conceived at an earlier period when the brain was free from the anesthesia of spirits, and at different times been reconsidered, it would grow to a fixed conviction, that no anesthesia would obliterate. Persons notoriously demented from spirits, have in certain ways manifested great wisdom and good judgment in words and conduct, that was clearly the conceptions of earlier years. This is seen in other relations of life, where a persistent idea may remain dormant for a long time, and survive the changes of disease, and appear as a flash of reason in the night of mental darkness.

The will of Mr. Pond was not the product of his diseased brain, it was not the outgrowth of his delusions or the influences of the surroundings. It was conceived farther back in his history before he began to use alcohol or opium to any extent. It was grown and nurtured not in the toxic states of alcohol and opium, but in the free intervals, in the lucid periods.

One of the effects of opium is to slow down the nerve force or current; this popular expression is intended to express diminished nerve sensibility and power. Profound and general narcotism, chemical sleep that deepens to cessation of nerve power and vitality, partial at first, then complete in death. Physiologically this may be spasm or nerve contraction, either of the centres, or along trunk lines, or at the terminations. No one has ascertained what the physiologic

conditions are. As in the study of the effects of alcohol, we only know a few facts of the vast unknown that awaits discovery.

As in alcohol, the use of opium soon produces a certain toleration. The use of ten grains a day is not followed by double the effects of five grains. The use of large doses of morphia daily is not followed by the physiologic effects commensurate with the size of the dose.

Beyond a certain point of chemical saturation, morphia becomes practically inert. What the physiological and pathological conditions in such cases are is unknown. Yet in these large doses there is a great effort manifest by the eliminating organs of the skin, kidneys and respiration to throw off the poison. If the morphia taker uses alcohol, the toleration increases, and an unknown neutralizing power appears. A quart or less of spirits and twenty grains of morphia daily makes an unknown chemical compound, whose effects can not be predicted. A double anesthetic and compound of toxins and ptomaines are present and the symptoms are equally uncertain.

There is undoubtedly some unknown and conserving power, which limits the injury of these conditions and saves the brain and nervous system from the destruction that would naturally follow. Chemically these enormous doses can be reduced in size from a half to two-thirds without creating any disturbance. Thus where twenty grains of morphia and a pint of spirits are used daily, the spirits can be removed and the morphia reduced below ten grains at once and lower with close attention to elimination, and psychical treatment. The general dementia of these cases does not increase beyond a certain point, and yet a certain instability and paroxysmal explosive condition is present.

In the Pond case the use of both morphia and spirits together in large doses, would not of necessity mean greater dementia, but rather more instability, with explosive acts and conduct. Of course the same incompetence to devise or originate any new plan or thought or act would exist. But the dominance of a previous conviction would not be obliterated, or an accustomed line of action or reasoning be

broken up. His reason and conduct would vary in particulars and at times in certain conditions, but the tendency would be constant to return to the speech and manner of former times. His former convictions of questions relating to his personal life, to his property, to his family, would remain with slight change.

The effects of alcohol and opium fall most heavily on the functional activities of the higher brain. The ethical brain centers that concern character, duty, consciousness of right and wrong, are like the lower sensory centers, anesthetized and enfeebled. The product of these defective brain centers is always faulty and an exact reflex of this condition.

The Pond will gave no evidence of physical degenerations in its provisions. There was no palsy or loss of sense of duty and obligation in its terms. It was clearly the work of a brain not disorganized to the extent, that the use of spirits and opium would indicate. The use of spirits and opium about the time of executing this paper, is not manifest in the will and the inference is unmistakable that this was the thought of an earlier time, a conviction which had come down from some point in the past.

The use of the word alcoholism to describe all cases in which spirits are used to excess is misleading. In reality a number of diseases are noted by the symptom of craving and desire for spirits. The history of a long period of moderate or occasional drinking, then a period of excessive use of spirits or other drugs until death, is the record of progressive degeneration with a systemized acute stage ending in death. Cirrhosis, Bright's disease, the various heart affections and some acute local inflammations, are often associated as causes or effects of this state. The use of alcohol may be the cause or the symptom of these degenerations.

An active business man who drinks in great moderation, becomes an inebriate suddenly after he reaches middle life, and dies a drug and spirit taker, a few years later. What has occurred? Simply some profound degeneration has begun, which is manifest in the craving for relief, for rest, from the psychical pain, or starvation of nerve centers, by the anesthesia of alcohol.

When this narcotism has reached a certain point of saturation, opium or chloral, or other drugs become a grateful change. Pond had used spirits in moderation and was called a temperate man in a general way up to a certain point, then he became an excessive spirit drinker, and alternated it with opium until death. He had cirrhosis and died with some suspicion of sulphonal poisoning. This is a common history with the unknown problem of how far spirits or drugs used were the causes or symptoms of his condition. One general fact helps to clear up the mystery somewhat. Where alcohol is primarily the first and only cause, there is continuous states of unsystemized delirium with progressive dementia. Where alcohol is a symptom of nerve and cell defect, or chemical degenerations, or toxines, the deliriums, dementias, melancholias and nerve explosions are transient and of limited duration. In one case the brain suffers from the continuous progressive palsy, open or masked, yet always becoming feebler. In the other there is intermittency, shortening periods of former health and brain vigor, free intervals in which no change appears superficially, duties and rational conduct are recognized and carried out, as in health. But the brain becomes more automatic and follows more closely currents of previous thought.

Pond probably belonged to this class and his drug taking was symptomatic. While literally insanity in the general meaning of that word, it was the insanity of general progressive degeneration, marked by slow progress and obscure uncertain halts. There is to-day in this city a man who uses large quantities of alcohol, alternated with opium, chloral and cocaine, who is managing large business interests without comment. He is insane and should he commit a crime his mental condition could be clearly established. Yet his conduct in business matters is safe and rational. This is really automatic and along lines of long accustomed act. When he dies the same questions may be raised concerning his will and the answer must turn on the reasonableness and rationality of the will. The sweeping assertions of the experts in the Pond case, that no one in his condition could be of a sound,

disposing mind was only a half truth. The absence of any cross-examination failed to bring out the facts and conditions which would show the other half of the real truth.

The experts on the other side who expressed doubt of the insanity of Pond from the evidence presented and gave the impression that his drug taking and changes of conduct were not sufficient to prove insanity, passed beyond the range of ordinary psychological reasoning. The effort to explain the reasons for such views ended in a jungle of words and mediæval statements that clearly failed to do justice to their well known intelligence. The eagerness and caution to give prominence to the facts which sustained a particular partisan theory was painful to the scientific sense of fairness in questions of this character.

Divested of all theories, opinions and speculations, Pond was clearly of unsound mind and insane. His execution of the will and the character of it was rational and sane. It contained no evidence of unsoundness and was a natural disposition of property, by the average common sense ability of sane men. That this act should be rational and all other acts and conduct be irrational is open to various explanations and theories. That this occurs is beyond all possible question. It is a clinical fact that can be verified. Of course the verdict of the jury was a contradiction of this. This trial again brought into prominence the utter hopelessness of ascertaining facts and their real meaning in the struggle of court room contests.

Two theories of a case are assumed, and every energy is concentrated to establish the one and disprove the other. Only such facts are sought and presented which sustain the assumed theory. Medical men are enlisted to support a theory, they are asked to decide from a mass of statements and evidence which is never the whole truth and always biased and restricted.

Day after day the medical experts listen to widely diverging statements of facts, without means of verification or power of discrimination, and at night are coached by lawyers, who seek to mould and shape their convictions, under the cover of consultation and

advice. Finally they become partisans and all unconsciously join in the strife to bring out a certain theory, which at any other time and under different circumstances they would not entertain a moment.

The scientific source of analysis of conduct, of the real meaning of facts and their application to the case in question, is enfeebled and perverted. The medical man on the witness stand as an expert, becomes a half judge and half partisan, and his confused efforts to assume both roles, brings ridicule and contempt to his testimony. This is great injustice and makes it impossible for medical men to make a satisfactory study and clear explanation of the facts in a disputed case.

Nothing could be more farcical literally, than this part of the Pond will case. Five really eminent medical men were pitted against each other to bring out and demonstrate two opposing theories—one that Pond was insane and incompetent to make a will, the other that he was sane and competent to devise his property. Each set of witnesses became partisans more or less unconsciously, dropping judicial, scientific independence of thought and study and following the legal methods of assuming a certain theory true, and accumulating all possible evidence to prove and sustain it.

In the public mind the idea is prominent that medical men of all degrees of eminence are purchasable, to the extent of buying favorable opinions on any side of disputed facts of science. This is untrue. If the five medical experts in the Pond case had been called as a commission to determine the facts, there would have been an unanimous agreement. Separate them and range them in the legal formulaes and methods of securing facts, and they would differ. Not from motive or error of judgment, but from the faults of the system of procuring facts and judging of their meanings. A shrewd lawyer can group evidence in such a way as to give support to the most absurd theories, and the medical witness can be so restricted in his testimony in the court room, that he can be made to support it. Fortunately there has already begun a revolution in this. In several states medical

commissions have been called to decide and give written opinions and the reasons for them, outside of the battling of the court room.

The most important lesson in my opinion in the Pond will case to us as physicians is, first, to keep full notes of every case that is unusual, not so much of the exact drugs we give, as the opinions and impressions we receive of the persons and their conditions at the time. Such notes may form invaluable

data for the future. Second, when on the witness stand, refuse to answer any questions which concern facts that we are not thoroughly familiar with, and give no opinions that we cannot support freely and fully. Never lose sight of the fact that the contest of the court is a fight of lawyers to win—that truth and justice is only secondary. Never become partisan in such battles, or lend our influence along lines of doubtful and disputed facts.

A GENERAL CONSIDERATION OF PARASITISM, WITH SPECIAL REFERENCE TO THE TAPE-WORM.*

JAMES W. KEISER, M.D., READING, PA.

Many and mysterious are the numerous processes of development at work in the evolution of the different forms of life. One of the great forces in this development is the never ending conflict between the various forms of life. Every organism has many enemies working toward its destruction, either directly or indirectly, and its survival and development will largely depend upon its ability to escape them, either by its inherent powers of resistance or by the modification of its structure so as to better circumvent its foes. One of the greatest of these evolutionary forces is the ceaseless warfare of parasites upon nearly every form of life.

Parasitism is very common in the animal and vegetable world, and all the purposes for which it is intended in the economy of nature are largely cloaked in our want of knowledge, but we do know that in many instances it profoundly modifies the animal and vegetable functions and structures, and frequently plays an important role in the maintenance of life. Scientists hold that the most remarkable integumentary specialization found in the animal kingdom are really modifications of structure caused by parasites; that these acquired adaptations are intended to resist their invasion and that they are able to success-

fully defeat the never ceasing attack of larval parasites, eagerly struggling to gain an entrance or footing anywhere. The scales of fishes, the shells of crabs and lobsters are instances of such modifications. The peculiar shape of the star fish is attributed to modifications made to escape the invasion of parasites.

The most curious instances of parasitism are those numerous instances where low forms of animal and vegetable life have formed a permanent union and linked their fortunes together, to the mutual advantages that such a union gives. The radiolaria, an order of the sub-class of the protozoa, presents numerous cases of such a union, or consortism as it is generally called. To the biologist the union of these elementary forms of animal and vegetable life make an ideal condition of living. The vegetable cell obtains from its associate the carbon and nitrogenous waste, and, as its consort is sufficiently transparent, all the necessary light that it requires. The benefit to the animal cell, is that its waste products are consumed while it is supplied with oxygen and starch, and it can also digest the vegetable cells after their death.

All fungi are either parasitic or saprophytic, and the only difference of the latter with the former is that it acts upon decaying substances and is the cause of putrefactive changes.

*Read before the Reading Medical Association, July 29, 1896.

The study of parasitism led to the first promulgation of the germ theory of diseases and also the theory and principles governing modern antiseptics. All pathologic bacteria are parasitic in their nature, and are the direct causation of many diseases, such as tuberculosis, cholera, the fevers, the exanthemata, and many skin diseases.

These illustrations show what a potential influence parasites have in the plant and animal economy, but the features which most interest the physician are those destructive influences upon human life as now constituted. The contagious and infectious diseases are not classed as parasitic diseases, although they are as much so as scabies, trichiniasis or tinea sycois.

Parasites are so common that their number and even species outnumber the non-parasitic forms of life. The majority derive their main support from the host, but many are free to wander from animal to animal. The larger number are free in their youth, some become so in their maturity, and in others freedom is a permanent or a life habit.

The theory of their spontaneous generation is no longer tenable. Animals frequently in their food and drink swallow other animals, and if the environment is adapted they could easily develop into parasites. Again animals which would seek to deposit their larva in other animals, finding the environment congenial and supplies of food at hand, might remain. Frequently these low forms of life seek the host and use him as a maternity asylum. Once a lodging gained, some of them by variation adapt themselves to the new surroundings, and in after generations the intimacy becomes greater and more permanent. In the majority of cases parasites gain an entrance by food and drink. Eggs are frequently transferred to animals by actual contact. The spread of parasites is very much similar to that of the seed of the vegetable world, and wind and water and also passing animals facilitate the spread of the ova. These eggs are well protected, generally by a tough thickened shell, so that they can resist prolonged draught, burial and changes in climate; and yet they frequently retain their

vitality for a long time, all that they require to be quickened into life being a favorable soil.

Laukart pointed out that a tape worm has an average life-time of two years, and produces in that time 1500 proglottides, a perfect sexual segment of a taenia, each one containing about 75,000 ova. As tape worms are not increasing, the changes of one of these eggs to reach maturity is only one out of 85,000,000.

There are eight varieties of tape worms affecting man and they all belong to the entozoa class. Of these the most important are the taenia solium or pork tape worm, and the taenia medicanellata or beef tape worm, and perhaps a third, the taenia tanella or nut-ton tape worm. The pork tape worm is popularly considered as the kind that is almost exclusively found in this country, but of a number of specimens examined by the late Prof. Leidy every one was of the beef. I think we must admit that beef is much more largely consumed than pork in this country, especially in the east, and, therefore, we should expect, which is probably the case, to find the taenia medicanellata much more frequently than the taenia solium.

The life history of the tape worm is peculiar. It can only become sexually perfect in the intestinal tract. A taenia ten feet long has about 800 segments, and at about 450 segments from the head they become sexually perfect. These segments or proglottides are examples of true hermaphrodites, and the segments as cast off and become voided, become disintegrated and thus the ova are liberated. These ova are about $\frac{1}{16}$ of an inch in size and have a hard calcareous coating, which enables them to resist moisture, the digestive fluids, also moderately strong acids and alkalis. Their tenacity of life under all circumstances is remarkable and they can retain their vitality for a long time under very unfavorable circumstances. These ova deposited in the earth or grass are scattered everywhere by the wind and water, by insects, etc. The animal that unconsciously eats them, generally the pig or cow (very rarely man) liberates them by crushing their tough coating in chewing them with their food. Such a rupture is essential

to liberate the embryo, the proscœlex, which consists of a small contractile vesicle, measuring only $\frac{1}{15}$ of an inch. It is armed with three pairs of spikelets. And with these it is able to burrow through the tissues. It frequently penetrates the blood vessels and is then washed to remote parts of the body. After being deposited in the tissues and encysted it is termed a scolex, and its contents, the embryo proper, a cysticercus, and it is this that gives meat a measly appearance. Meat, thus affected, is not particularly unwholesome, providing it is cooked to such a degree as to destroy all the vitality of the cysticercus. If such meat is eaten and not properly cooked the cysticercus enters the alimentary canal, and is then called the strobilia embryo which develops into mature segments connected together, and at last it has found its permanent resting place where it can reach its maturity.

The head of the tape worm has four orifices or suckers, surrounded by papillae or hooklets. The beef tape worm has the orifices larger, but the hooklets are very much smaller than in that of the pork. On account of the smaller hooklets it is easier to dislodge the beef than the pork tape worm. To discriminate the different varieties of taenia is not of any practical importance, as the same remedies answer for them all.

Fortunately tape worm is rather a rare affection in civilized man. In Abyssinia where the natives eat only raw meat, it is said that every inhabitant has a tape worm. The only prophylactic measure necessary to prevent tape worm is to eat no meat unless properly cooked. As a matter of safety all measly meat should be destroyed. The cysticercus stage of development is almost unheard of in man, but is possible and cases have been reported of the cysticercus teloe cellulosa affecting the muscles, heart, liver, choroid plexus and the different tissues of the eye. In these cases the most probable mode of infection would be by the drinking water. If a person should swallow the ova of a tape worm the gastric and intestinal juices would not be sufficient to liberate them, as I have already mentioned, and they would pass harmlessly from the body by way of the intestinal tract. One having

a tape worm and manufacturing ova by the thousands, and they being microscopical objects, no doubt, frequently by fingers and other methods, do convey them to his mouth, but no damages result unless crushed by the teeth or liberated by some other mechanical agency.

The symptoms of tape worm have been very much exaggerated. Epilepsy and chorea have been attributed to their presence, but such consequences are exceedingly rare. They can cause vertigo, tinnitus aurium, disturbances of vision, pruritus at nose and anus, weakness, salivation, disordered appetite and digestion, neuralgic and colicky pains about the abdomen, restlessness and disturbed slumber. But these symptoms are incident to many conditions and are not sufficient to base a diagnosis. The one pathognomonic symptom is passing the links of the worm. The discharge of these links is very common and to exclude or confirm their presence the feces should be inspected for several weeks. To make a speedy diagnosis a brisk purgative can be given and then if a worm is present some portions will be passed. Some persons without any reason develop the idea that they have a tape worm and this delusion may become so fixed that it passes the border line of sanity. Before treatment is begun we should be absolutely certain of the correctness of the diagnosis.

I desire to relate a case which I have treated during the past ten days, and think, successfully. The only symptom that the patient had was a variable, and at times, a voracious appetite. Occasionally he passed small flakes of tape worm, as he called them, which at the time caused a feeling of weakness and sometimes amounted almost to prostration. Frequently in walking he involuntarily passed them in his trousers much to his annoyance. These symptoms he had for about two years. I informed him that he probably had a tape worm, but before I would institute treatment he must put some of the flakes in a bottle, so that I could examine them and pronounce a positive opinion. My treatment was as follows:

I gave rigid orders that the next day he was to abstain from all solid food.

He could have as much milk, tea or coffee as he desired. I ordered three drams of the oleoresin of male fern, and at bedtime he was instructed to take one teaspoonful well diluted with milk. The following morning one half teaspoonful every hour until it was all taken, then to be followed with four grains of calomel. He took the tea spoonful as directed and at about three o'clock a.m., had a slight passage, one hour later he had a large movement and passed the worm that I have with me to-night for your inspection. He took all the medicine that I prescribed and I am sure the entire worm was expelled. In the specimen the long, slender neck shows, and at about the junction of the head and neck it is torn off, so the head is absent and the specimen is not quite perfect. But after the worm it also was expelled, he took twice as much of the tæniacuge, followed by four grains of calomel. I feel morally certain that it has been entirely voided, and the cure is permanent. Flint says that, as a rule, if nearly all of the tape worm from a point high up be expelled, it will be killed and a cure made. The flowers of Koussa, the bark of pomegranate root, the seed of the pumpkin, chloroform, and the oil of turpentine can all be successfully used to destroy this parasite.

At the discussion on tape worms in

this city, before the State Medical Society, Dr. Tyson, of Philadelphia, said that cases of tape worm are rare, and at the clinic of the University of Pennsylvania, only one case turns up with clock-like regularity every year. If so infrequent in hospital and dispensary practice, it must be much more so in private practice. Dr. Tyson also admitted that quacks were more successful in treating tape worms than the regular profession. If this opinion is correct, it must be due to the neglect of diet and timidity in dosing with drugs with which, in the very nature of things, we can have little experience. I determined the dose to give to my patient, who was a big, robust fellow, by first ascertaining the minimum quantity that has proved fatal which was six drams, and so I ordered half this quantity to be given in divided doses, which is somewhat more than is generally recommended. If my subject had been a delicate person I would have ordered less.

I know of a case of tape worm in a gentleman who cured himself without a doctor by simply filling his pockets with pumpkin seed and chewing them *ad libitum*. As these seeds are sweet and palatable, and if this simple method of cure would be found reliable, without any restriction of diet and employment of purgatives, it would be the ideal treatment in this troublesome affection.

THE USE OF NITRATE OF SILVER IN THE PHARYNX.

LEWIS S. SOMERS, M.D., PHILADELPHIA, PA.

Nitrate of silver has in the past been used in nearly all the affections occurring in the pharynx, and is to a less extent in use at present. It has been vaunted as a sedative in acute inflammations and as an escharotic in chronic hypertrophies, until one is tempted to ascribe to the drug a sort of occult power especially exercised over the faucial region. The drug when used properly is of much value in certain pharyngeal disorders and occupies a definite place in the list of local remedies applicable to this region.

Nitrate of silver is used as a local remedy in two forms, solution of various degrees of strength and the solid salt, the latter either in the stick or melted on an appropriate applicator. The varied results obtained in the hands of the general practitioner have been due to the indiscriminate use of the drug without reference to it being solid or liquid. It will not be out of place to give a short resume of the local physiological action of the two forms noted, before indicating the various conditions in which it is of value.

The solid stick, the *argenti nitras fusus* of the pharmacopeia, when applied locally to the mucous membrane, acts as an escharotic or caustic to a moderate degree, only superficially devitalizing the tissues, and is especially indicated in superficial ulceration, non-malignant neoplasms too small for operative interference, and cauterization of the wound after removal of a small new growth.

When used in solution, the local effects produced depend upon the amount of salt present. As silver is incompatible with all organic materials and with the larger proportion of drugs used locally, the solutions are best made with water, the drug being soluble in its own weight of water. Glycerin is occasionally used in combination, but never alone as a solvent, on account of its possessing marked affinity for water, causing dryness of the mucous membrane with severe burning pain. The local physiologic action produced by solutions can be better described by noting the different effects produced in the pharynx by weak and strong solutions.

A solution containing from one to forty grains of the salt to an ounce of water, when directly applied to a portion of the pharyngeal mucous membrane, exerts a protective, stimulating and astringent effect, and generally produces a moderate amount of discomfort, although not amounting to a decided pain. It not only possesses these properties, but exercises a peculiar alterative action over local nutrition. It acts as a local antiphlogistic. Strong solutions have the peculiar property in contradistinction to weak solutions of not producing painful sensations. In this connection, over one hundred cases of pharyngeal disease where silver was indicated, were subjected to local applications of a saturated solution of the drug and the result showed a total absence of unpleasant sensation in every case.

This absence of pain is due to its local anesthetic effect, noticeable only in strong solutions. Solutions in contradistinction to the solid form do not devitalize the tissues with which they come in contact. The protective action depends upon the drug coagulating albumin, forming the albuminate, mucinate and chloride of silver, thereby pro-

tecting the tissues beneath. Its special value in superficial inflammations to a greater or less extent, depends upon this protective membrane which is formed, covering the inflamed surface. When applied to the tonsils, the membrane formed resembles to a certain extent, that produced by the Klebs-Loeffler bacillus; in these cases the differential diagnosis can readily be made by the history of the previous use of the drug. The constitutional symptoms are as well marked in tonsillitis for which the drug is used, as in diphtheria. This point may seem of very little practical importance, but cases are frequently seen which have recently had an application of silver to the tonsils at the hands of another physician and much anxiety and unnecessary trouble may be prevented by ascertaining the cause producing the grayish-white membrane present in the fauces.

Solutions may be used in the steam atomizer, the strength, however, not exceeding ten grains to the ounce of water and glycerine, equal parts of each. In acute pharyngitis, if the case is seen within the first day of the disease, a strong solution applied with a camel's hair brush or cotton tuft on an applicator to the inflamed mucous membrane will generally abort the attack. Care should be taken to avoid using more of the solution than is absolutely necessary, applying the drug over the affected parts of the pharynx only, for if used too freely its stimulating properties become at once apparent and the inflammatory trouble will be aggravated.

Muirhead recommends daily painting of the fauces in acute pharyngitis, with a solution containing forty grains to the ounce of water. If the disease is not seen and treated at its inception, it is better to wait until the dry stage has passed and use a two to five per cent. solution on the inflamed portion when free secretion becomes established. This treatment is also of value in acute tonsillitis without the presence of pus. Cohen has used local applications of the solid stick of silver in acute tonsillitis with favorable results, but care must be exercised to avoid aiding the disease, and if good results are not obtained within twenty-four hours, other medication becomes advisable. Rarely, an

attack of acute pharyngitis becomes characterized by local minute hemorrhages from the intensely engorged faucial vessels (hemorrhagic pharyngitis). It then becomes necessary, in addition to whatever means we are using, to subdue the inflammation, to control the bleeding points. In these cases, probably, Natier has had the largest experience, and has rapidly overcome the trouble by applying a strong solution of silver to each extravasating or bleeding point.

After frequent repeated attacks of acute pharyngitis a catarrhal condition of the mucosa is very apt to remain and prove more or less resisting to treatment. This condition apparently precedes a chronic glandular sclerosis or hypertrophic condition of the faucial region. Rilliet and Barthez as quoted by Smith, use a powder containing ten grains of silver nitrate to the ounce. This is especially valuable in children as only a small amount is necessary for each application and it is much more easily applied by gentle insufflation than a solution of equal strength. The bulk of the powder is usually composed of starch, but any bland, non-irritating powder may be used. Powders containing silver are seldom used at present for pharyngeal affections, as solutions are much easier of application in the adult, do not produce cough, are more rapid in action and vastly more effective. In general it may be said that powder is indicated in preference to solutions whenever the long continued action of the medication used, is desired.

By far the best results observed in the use of silver in the pharynx, are in the follicular hypertrophy and congestion forming the complex symptom known as granular sore throat or catarrh. We may conveniently divide this form of pharyngitis, as regards treatment, into three classes. (a) where there is a diffuse inflammation and thickening of the tissue of not long standing, without noticeable enlargement of the follicles; (b) where the follicles are much enlarged and form the characteristic feature of the affection, the blood vessels in this form often being enlarged and tortuous and clearly discernible ramifying over the pharyngeal wall; (c)

sub-acute and chronic inflammations in which as contrasted with the first two forms, the glands and sub-mucous tissues are much hypertrophied. In this last class silver in any form is harmful and should never be used.

Solutions only are applicable in the conditions mentioned in the first form of the affection, and are then of value when used two or three times a week in gradually increasing strength, beginning applications with about forty grains to the ounce. When the follicles are much enlarged as in the second form, the solid stick or crystals of silver melted to form a bead is applied by first splitting the follicles, and cauterizing their interior, a few only being treated at each sitting. This process is repeated at frequent intervals until the cure is completed. Some authors advise curetting the enlarged glandular tissues and then cauterizing the base, but this method is productive of more or less inflammatory reaction and offers no advantages over the former. If the walls of the capillaries are much thickened they may be cut across with the knife and then obliterated with the solid stick of silver.

Sometimes we observe a form of pharyngitis characterized by collections of dry and decayed secretions in the follicles, occurring most frequently in chronic granular sore throats of long standing. After removing as much of the extraneous matter as possible from the follicles, the best results are obtained by cauterizing the small cavities remaining, with the solid stick of silver shaped to a sharp point. When the tonsils are much hypertrophied and especially if fibrous changes have taken place, the use of silver as an agent for the reduction of the hyperplastic changes, has been superseded by the various methods of operative removal and the electro-cautery. The special field of usefulness for the drug in this affection, is in two forms of chronic changes of the tonsillar tissues; first, where the crypts are filled with necrotic and cheesy masses, the so-called follicular tonsillitis, and secondly, that form characterized by a moderate hyperplastic overgrowth of the tonsillar tissues without much evidence of fibrous tissue formation.

The first form may be brought to a successful termination by removing the contents of the diseased crypts with probe or curette, then cleansing with peroxide of hydrogen and finally thoroughly cauterizing the cavity in the same manner as is done in follicular pharyngitis, or instead of using the stick of silver the crystals may be melted into a bead on an appropriate applicator and cauterization effected. This treatment should be repeated three or four times a week and may safely be done at frequent intervals as there occurs no reactive inflammation as is produced when the actual cautery is used. When there is moderate enlargement of the tonsils without special involvement of the crypts, a saturated solution of the drug applied at frequent intervals over the entire surface of the hypertrophy will rapidly reduce it in size without the production of any unpleasant symptoms. Holmes, in this form of tonsillitis, uses the bead of silver pressed into the tonsillar crypts, thereby setting up an inflammatory reaction of their walls with resulting adhesion and general cicatricial contraction.

During the course of infectious diseases such as measles or scarlet fever, the pharynx becomes involved in quite a large number of cases; care must always be exercised in the treatment of acute pharyngitis occurring under these conditions and frequently spraying the inflamed surfaces with a mild antiseptic solution is more advisable than other more energetic applications. Silver is never used in these cases when the inflammation is acute as other measures have proven of more avail, but is indicated when bad ulceration occurs as a complication of the infectious process and then seems to hold the local destructive process in check.

In lupus of the pharyngeal wall Asch has used a saturated solution with much benefit, but unless the area involved by the disease is small and circumscribed, silver will be of little value, more powerful agents being indicated. In the syphilitic patches involving the faucial region either the solution or solid stick exercises in conjunction with constitutional treatment, a decided influence towards the rapid healing of the specific ulcer. Care must be exercised, how-

ever, in using the solid drug not to produce too deep an eschar.

Erysipelas involving the pharyngeal mucosa may be aborted or cut short by applying a solution of silver as recommended by Cohen. The method consists in painting the effected area with a sixty grain solution so as to produce a margin of unaffected structure. The drug is used in pharyngeal neuroses only when indicated for any condition present acting as a local cause for the production of the nervous phenomena. A weak solution of silver is of value in dysphagia when due to some local pharyngeal disease not malignant in character. The strength of the solution should be from five to ten grains to the ounce of water.

Ex-Medicos.

About fourteen per cent. of the entire number of medical graduates drop out of the profession within a few years. Some few never practice; others are tempted by better inducements into other fields of work; some are driven to suicide on account of failure; others succumb to contagious diseases; still more lose their health on account of exposure to inclement weather and accident, or on account of mental anxiety. Among those we must include those who become insane or who contract the alcohol, morphine, or cocaine habit. Worse than all else, a few are driven into quackery. Any one may make a mistake in the choice of life-work, and it is no discredit to abandon practice. There are plenty of honorable employments for unsuccessful physicians: there are schools to teach, merchandise to sell, drugs to dispense, news to gather; at any rate there is coal to shovel and wood to saw. It doubtless seems a pity to sacrifice the investment of three or four years' hard work in the study of medicine, but it is cheaper than to sacrifice honor and prostitute medical science to quackery.—A. L. BENEDICT, in *Lippincott's*.

Isn't it a Wart?

Dr. X— begins a communication to a contemporary: "I have on hand an enlarged prostate."—*Medical Record*.

CURRENT LITERATURE CONDENSED.

A Comparison of the Known Advantages and Disadvantages of Vaginal vs. Abdominal Hysterectomy.¹

The recent advances in pelvic surgery through removal of the uterus and its appendages by the vagina, have been favorably commented upon at the proceedings of various medical societies, even by conservative surgeons. It is evident, from the success obtained by several French surgeons, and results equally brilliant by American operators, that vaginal hysterectomy, through a perfected technic, has materially advanced in position within the past year or two. Unlike abdominal hysterectomy, however, its field of operation, at least at the present time, is somewhat circumscribed.

While one cannot rely entirely upon statistics appertaining to either medicine or surgery, it may be said that the percentage of deaths resulting from vaginal hysterectomy compares favorably with that of extirpation by the abdomen.

The advantage of doing a total extirpation by the latter method is that, by means of the Trendelenburg position, the eye plays a part equal to that of the finger, in that the field of operation is usually in full view, the ability to deal with every phase of supra-pubic complication being thus readily admitted.

As regards the rapidity of operation by the vagina, with the use of clamps, as compared with ligatures when operating through the abdomen, one must take into due consideration the sloughing process with accompanying discomfort and pain in the use of and removal of the forceps, as a natural result of the after treatment in vaginal hysterectomy.

In myomata or myofibromata, of not unusual dimensions, and in septic uteri with accompanying pelvic suppurative conditions, total extirpation by the vagina answers a ready method. In the perfected technic, as resorted to by Ségond, the entire operation is in the field of vision, the eye in these instances

also playing a part equal to that of the finger.

Tumors of whatever size, if complicated by extensive adhesions, can best be removed through the abdomen. The same may be said of cancer of the uterus, because of its tendency to invade surrounding tissues, this necessitating complete removal of the parts affected, and even beyond if possible.

The absence of hernia, and perhaps somewhat diminished shock, in that the intestines are usually but slightly disturbed, are favorable to vaginal extirpation, while possible injury to the ureters and bladder must be equally taken into consideration.

Finally, as to the question of drainage, more particularly in suppurative conditions, it is undoubtedly more perfect through the apparently natural channel, the vagina.

Treatment of Retained Menses.²

If the average student were asked the proper treatment for retention of the menses, he would probably answer that the fluid should be aspirated with every precaution through an orifice made *ad hoc* through the hymen or the structures representing the same. This answer is correct in respect of cases of hemato-colpus, properly so-called, viz., cases in which the retention is due to imperforate hymen or to atresia of the vagina low down, but it is very inadequate in the not uncommon instances of complete absence of a vagina, either from congenital deficiency or as the result of acquired atresia high up. In this case the uterus itself is necessarily distended, and there is a real danger of the dilatation extending to and involving the Fallopian tubes, constituting hemato-salpinx. Several important facts call for consideration in this class of cases.

In the first place, access to the os uteri has to be obtained through a passage artificially dissected out between the bladder in front and the rectum behind. Now this passage, when destitute of a mucous lining, is practically

¹Edward Nicholas Liell, M.D., lecturer on Gynecology New York Polyclinic.

²Medical Press and Circular.

impossible to maintain patent, and re-accumulation of the fluid, with recurrence of the symptoms, sooner or later follows. In the second place, the treatment of cases of hematometra associated with hematosalpinx is somewhat dangerous, owing to the risk of regurgitation of the fluid contained in the dilated tubes, or of their rupture. In view of these two conditions, it has been urged that the proper treatment is really to perform abdominal section, in order to remove the uterine appendages with the object of determining cessation of menstruation. Obviously, no such grave intervention would be justified except in the presence of a formal diagnosis of hematometra, plus total absence of the vagina. When the defect is congenital it not infrequently happens that the uterus and ovaries share in the arrest of development, in which case no treatment may be called for. Gynecologists may consider themselves dispensed from the obligation of setting to work to create a vagina simply because the patient does not happen to be provided therewith, for unless by ingenious plastic devices a mucous lining can be secured their labor will be in vain, the aperture invariably undergoing gradual closure owing to progressive cicatricial contraction. Such cases are not always easy to diagnose, and when diagnosed they often present considerable difficulties in the way of successful treatment. Fortunately, they are tolerable rare, though most gynecological surgeons of much experience have met with a certain number.

The Prevention of Tuberculosis.

The authorities of the city of Hamburg have issued a circular for general distribution, containing the following facts and recommendations intended to prevent the dissemination of tuberculosis:

More persons die annually from tuberculosis than from any other disease. In Hamburg the number of deaths yearly from this cause exceeds 1500. No other disease interferes to the same degree with the activity and welfare of a community. The lungs are the most common seat of the disease, but the glands, bones, joints and other organs

also suffer and the lungs may be affected secondarily. The disease is especially disseminated in two ways—through the sputum of the victims of pulmonary tuberculosis and through the milk of tuberculous cows. As a rule, months, sometimes years, elapse between the lodgement of the germs and the manifestation of their activity. Transmission through the expectoration may take place directly through cough. More commonly, however, the sputum dries upon walls, handkerchiefs, clothing, and utensils, and is reduced to powder and inhaled by healthy persons. Children are especially liable to infection, not only because the susceptibility is great in early life, but also because they play upon the ground and are likely to introduce their soiled hands and toys into their mouths. The susceptibility is increased at times of bodily disease and in children especially during attacks of measles and whooping-cough. Small wounds of any kind may constitute a portal of entry for the germs of the disease. To prevent transmission through the sputum it is necessary for all persons suffering with cough to hold a hand before the mouth during the act of coughing and to void the expectorated matters into special receptacles. Attendants and others should see that this precaution is rigidly observed. Every tuberculous patient who neglects this rule jeopardizes the health of those about him and especially that of the members of his family. The observance of the rule renders the tuberculous patient free from danger to those about him. Cuspidors should be provided for all rooms in which many persons come together; they *must* be provided for rooms used by tuberculous patients. The cuspidor may contain sawdust, shavings, oakum or water, and the contents should be frequently changed and, if possible, together with the sputum, destroyed by fire. Clothing, linen, eating utensils, and other effects, soiled by tuberculous expectoration should be at once cleaned perfectly, preferably by boiling or other mode of disinfection. The utmost cleanliness, the freest ventilation, and the greatest amount of sunshine should be secured in rooms occupied by tuberculous patients. The formation and distribution of dust should so far as possi-

ble be prevented by the use of water. Rooms long occupied by a tuberculous patient or in which such a patient has died, should be thoroughly disinfected. No house in which a tuberculous patient has lived should be occupied by others before such disinfection has been practised. This will be done at moderate cost by the city authorities, or gratuitously when justified by the circumstances of the case. Tuberculous and healthy persons should not occupy the same bed. Children should be excluded from the rooms used by tuberculous persons. When tuberculous persons are occupied in the preparation of articles of food, or the manufacture of clothing, or when tuberculous and healthy persons associate (as in schools, factories, places of business, etc.) rigid care must be exercised with regard to the sputum and the greatest cleanliness must be observed. Tuberculous women should not suckle children. Tuberculosis in cattle is common in the neighborhood of Hamburg, and often difficult of recognition. As the germs pass over in the milk, all milk used as food should be boiled. The prognosis in cases of tuberculosis is the more favorable the earlier medical treatment is begun.

The Control and Supervision of Public Water Supplies by Sanitary Authorities.

The extent of popular indifference and inattention to questions of public water supply, and the almost complete absence outside the metropolis of power to ensure proper watchful insistence that such supplies shall be adequately guarded from pollution, is most extraordinary.

The Public Health Act enacts that any urban or rural authority may provide their district with a supply of water proper and sufficient for public and private purposes; and though the words "may provide" are permissive and enabling, if the local authority do not avail themselves of this power where water is required and they can procure it, they will be in default, and can be compelled by the Local Government Board to make such provision. The local authority may either contract with

any person for a supply, or construct or purchase waterworks, and the local authority shall provide and keep in such waterworks a supply of pure and wholesome water. Such private persons or companies are required to provide and keep in the pipes to be laid down by them a supply of pure and wholesome water sufficient for the domestic use of all the inhabitants within the limits of their area of supply. Within the service area of a legally constituted company a local authority cannot, however, construct waterworks (except for the supply of water for their own use) so long as that company are able and willing to supply water proper and sufficient for all reasonable purposes for which it is required. Any local authority is empowered under such conditions to obtain a justices' order for the permanent or temporary closure or limited use of a public or private pump, well tank, or cistern. It is the duty of every rural sanitary authority from time to time to take such steps as may be necessary to ascertain the condition of the water supply within their district, and if there be reasonable ground for believing that any house therein is without a proper and sufficient supply of wholesome water, the authority, or any of their duly-authorized officers, are empowered to enter the houses in question, or the premises from which the water supply may be derived, for the purpose of ascertaining whether such house has such a supply within a reasonable distance.

In the metropolis matters are in a much more satisfactory condition, for we find that the Metropolis Water Act empowered the Board of Trade, after notice in writing to the Company, to inspect and examine the waterworks of the company, to inquire into and concerning the grounds of such complaints, and who shall, under very heavy penalty of neglect or refusal, be afforded by the company and their officers all reasonable facilities for such inspection, examination and inquiry.

The office of water engineer has also been created such official to be a competent and impartial person from time to time appointed by and removable by the Board of Trade, who shall from time to time, in such a manner as the Board of Trade direct, examine the water

³C. Porter, M.D., Ireland; D. P. H., Camb.; M. R. C. S., England.

supplied by any company. Major-General de Courcy Scott, R.E., the present incumbent of the office, informed the Royal Commission on Metropolitan Water Supply that his statutory duties involve periodical inspection of the metropolitan filtering works, attached reservoirs and water supply, to ascertain whether or not the water companies have complied with the provisions of the Metropolitan Water Act of 1852, which requires that every company shall effectually filter all water supplied within the metropolis for domestic purposes before the same shall pass into the pipes for distribution. General Scott adds that the definition "efficient filtration" is understood to mean, under the Act of 1852, that "the water in its physical appearance shall be clear, bright and free from suspended matter," and that his instructions and procedure are to collect samples of effluent as it issues from the filters and to examine each in a two-foot tube as these qualities. Such instructions and such a test appear to be crude in the extreme, for at the sewage works of a large city I have recently seen an unsatisfactory sewage effluent that would unquestionably have admirably complied with all these requirements, and almost every one knows that during the cholera outbreak of 1854, the death-dealing water of the celebrated Broad-street pump was bright clear and sparkling. Such puerile regulations could never have had the sanction of the State's responsible medical advisers, and presumably represent the humorous idea of potability of the Board of Trade layman or the prehistoric reminiscences and practice of some fossilised water engine, of which latter curiosity it is not yet, perhaps, impossible to find specimens.

General Scott stated that he possessed no compulsory powers of entry and inspection except to the filters and for seeing samples of water. In addition to the supervision exercised by the water examiner, Dr. E. Frankland, as is well known, is employed by the Local Government Board to examine chemically and in regard to bacteria purity the metropolitan waters as delivered; and at the request of the associated companies these examinations have been extended to the raw river waters

at the intakes and to the effluent water as it issues from the various filters.

At present, except in regard to the closure of polluted wells, pumps, etc., and the limited and questionable powers possessed by rural authorities under the Public Health Water Act, 1878, there is outside the metropolis no legal basis whatever for the obvious moral right of sanitary bodies to satisfy themselves that the sources and methods of purification of the water supplied to their districts by commercial companies is such as to leave no room for the entry to the distributing mains of matters of noxious nature. This power should by all means be also in the hands of sanitary authorities where the district is at the mercy of private companies, and there is consequently "the temptation to choose between dividends and disease," as Sir A. K. Rolit, M.P., has pithily said in regard to the notorious shortcomings of the East London Water Company.

In the discussion which followed Dr. Porter's paper, Sir Douglas Galton expressed himself as not quite so strongly in favor of much additional power, because he thought medical officers at present had power to ascertain whether water was pure. There was no doubt it was of great importance to give to authorities outside London power similar to that which was given in London, of appointing a water examiner or analyst in each county, and then for the medical officer of health for the county, town or district to be able to put in force those powers which the water examiner in London could exercise. He would not, however, advocate placing them under the Local Government Board or the Board of Trade. Dr. Squance (Sunderland) said there was no doubt it would be infinitely preferable to have water supplies controlled by the sanitary authorities, but it was difficult to educate local authorities up to this belief.

Disease and Recovery as Related to Therapeutics.

If we hope ever to understand the normal operations of the human body and mind, or their perversions, or the

⁴⁸ Solis-Cohen, M.D. Annual address before the Medical and Chirurgical Faculty of Maryland, Baltimore, 1896.

methods by which their perversions may be prevented or corrected, we must be able to bring them into line with the fundamental facts of general biography and to avail ourselves of all the aids that may be gained from collateral sciences. We must understand, so far and so fast as the progress of general biology and allied sciences renders possible, the nature of the life-substance and of the life-force, the modifications that these undergo under various circumstances, and what are the circumstances that are capable of modifying them. We must attain to as full a knowledge as possible of the various stages through which man has passed, physically and mentally, mechanically and morally, not alone in the development of the individual, but also in that of the race, for only thus can we understand the forces tending to departure from that which we are pleased to call the normal standing; whether in the direction of reversion to more primitive forms and processes, or in the faint beginnings of the more complex, which in their full fruition shall enable our posterity to solve without difficulty problems that to us appear inexplicable. We must recognize the dependence of man upon his environment, as well as the power of man to modify that environment, and especially must we bear in mind the fact that the evolution of man,—the tendency to progress,—has been toward the development and improvement of his nervous system, while other parts of his physical organism have remained in a condition less perfect than that of some of his brute relatives; that in fact the very condition of his progress has been not alone the diversion of energy from muscular and osseous systems to the nervous system, but also the maintenance of nervous structures in that plastic state, impressionable to the outer world and responsible to the inner workings, which alone permits of further modification and the assumption of new powers. Thus, in the course of nervous modification, before adjustments to new conditions have been completed, while the evolutionary process is still, as it were, experimenting, before choosing that which will best tend toward the end in view, and while the general placticity and impressionableness, per-

mitting of the development of variations from which natural selection may choose, remain, we must expect, a vast increase in the number of nervous diseases; but we must also learn to distinguish among them, so that we may not misinterpret as evidences of maladjustment or degeneration, processes which are manifestation of a new tendency toward readjustment, toward the generation of new powers and new faculties. So distinguishing, we must learn, moreover, to act in harmony with these new developments; for man alone, among the vast number of living creatures, has the power to consciously modify his environment and control in a measure his own evolution. Certain great truths concerning the nature of disease and recovery have been recognized throughout the course of medical history, and have always influenced the best teaching and practice. Disease and recovery may be looked upon as vital processes in which the organism plays an active part; in some instances, one continuous process. Neither morbid nor therapeutic agents endow the organism with new qualities, nor introduce into its operations new powers,—as the one, so the other can act only by modifying that which is habitual or evoking that which is latent. In disease there are presented two classes of phenomena, between which the physician must discriminate; the one morbid, that is tending to the destruction or impairment of the organism; the other salutary, that is tending towards its preservation and restoration to comfort and usefulness. The tendency of the organism to react in a salutary manner is often of itself sufficient to insure complete and perfect recovery, but it may be either deficient or excessive in several respects, especially as to time, degree and extent; furthermore, processes salutary in general may be morbid in respect to particular circumstances. When the processes are essentially morbid or when they become so by excess or deficiency or by circumstances of the individual case, the intervention of art is required, to assist, modify, control or prevent natural processes, to sustain the organism during their evolution, or to avert incidental or sequential dangers or damages. In such intervention, while

we may properly use drugs and must often do so, and while our resources have recently been greatly increased by the utilization of nature's own alexiteria and functional stimulants and regulators, yet we shall learn to place greatest dependence upon those agencies,—air, light, water, heat and cold, food, rest,

exercise of function, physical and mental,—which, as the habitual environment of man or his habitual reaction to the environment, have recorded their effects in his line of development, his structure and his faculties, and are still the most potent influences in his preservation and his progress.

DR. HOLMES'S NOVELS.

Many of us must remember the dominant idea of "Elsie Venner," in which the snake-mark is set upon the heroine before her birth, and a pure and noble woman-soul struggles with an intruding serpent-nature to the death. He told me once that he had written this without any basis of known fact, as an exercise of the imagination upon what seemed to him psychico-physical possibilities, and was amazed afterwards to receive letters from two men of character and position, one of them I think a Confederate official, describing similar cases in their families and wondering how he had heard of them.

Whether those two novels are still read or not, they deserve to be. The author was not a professional romancer indeed, but there are treasures of wisdom in them, and abundant human interest. Nor was Dr. Holmes merely the civic functionary, social ornament, and poet of occasion, that some seem to fancy. These were but phases of a variously gifted mind, entwined with a rich and generous nature. Above all, the man was genuine; not merely wit, but humorist; as true a union of aristocrat and democrat as we have seen, or are likely to see again. This must be felt by the thousands who knew him near at hand, and the tens of thousands who knew him somewhat further off, through the medium of his books. He often made us smile, he sometimes made us want to cry. Many things in his verse, and more in his prose, have gone to the general heart. The word that comes from England is surely echoed through America, that we have lost not so much one who posed for our amusement or spoke *ore rotundo* for our in-

struction as a near friend and an elder brother.—F. M. B., in *Lippincott's*.

Not the Same.

A neat example of the retort admonitive was recently made by a young Colorado mining engineer, whom we will call Morton, principally because that is not at all like his name. Seated in a chair in a Denver barber shop, undergoing a shave at the hands of a favorite barber, who, although an excellent craftsman, sometimes committed the mistake of becoming too familiar in conversation, the talk turned on the case of a man who, being on trial for murder, had been recognized by visitors to the court-room as a young theological student from a Middle State, where he had been the possessor of a spotless reputation and a totally different name. The conversation thereupon drifted to the subject of changed identities.

Morton's barber rubbed the razor reflectively, and said: "Yes, it's surprising how many men change their names after they get out West. By-the-way, Morton, what was *your* name back East?"

"*Mister* Morton," was the quiet reply.—From the "Editor's Drawer," in *Harper's Magazine*.

Night-work is a much exaggerated evil of the physician's life. In the first few years of city practice there is not a superabundance of either day or night calls, and to one who falls asleep full of apprehensions as to the success of the future, the jingle of the telephone breaks in upon his troubled dreams like sweet music.—A. L. BENEDICT, in December *Lippincott's*.

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Editorial Staff:

A. L. BENEDICT, A.M., M.D.

SAMUEL M. WILSON, M.D.

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PHILADELPHIA, SATURDAY, NOVEMBER 21, 1896.

PUBLISHERS' NOTICE.

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EDITORIAL.

DIGESTIBLE WATER.

The taunt most frequently leveled at conservative Philadelphia by outside Philistines has been her lack of progressiveness. In some instances the reproach has perhaps been undeserved, but in many others it must be confessed, however reluctantly, that it is but too just. But Philadelphia is at last falling into the line of progress. Many steps have been taken in the line of preventive medicine. Her streets begin to present less of the appearance of a general

dumping ground for rubbish; the rookeries, hotbeds of crime, that flourish in the city's heart are being abolished. She has protested vigorously being discriminated against by railroads, and she has obtained dollar gas. True, her citizens still decline to support home publications, and have a disposition, at least in some professional circles, to seek individual exaltation by the process of pulling down all who might become possible rivals. But the city is advancing, however slow the rate of progress.

In many cities the pace of advancement in matters sanitary has been set by the city fathers. In Philadelphia, unfortunately, the converse seems to be true. The powers that be act as a clog on whatever spirit of progress is shown by the public. All that has been gained has been at the expense of long and persistent demand, and there is not the slightest doubt but that in the matter of sanitation alone many valuable lives have been sacrificed to imperfect conditions, long after the demand for the change of such conditions has been made.

In no particular is this fact shown more clearly than in the matter of the water supply for the city. The agitation over the necessity of a change, either in the sources of supply or by the filtration of the supply in use, was begun as early as 1876. Under the stimulus of a particularly severe revolt from using for potable purposes a liquid colored with mud and coal dust, flavored with sewage and algæ, and, under the microscope, teeming with disease germs, the city fathers would occasionally awake from their lethargy long enough to begin an inquiry like that of 1883, hear the report, and then, upon the recommendations made by the expert employed, consistently go to sleep with a pleasing consciousness of duty done. What more could the public demand?

Official inquiry should be a panacea for all woes, and if the people would only let the water rest as the city fathers did their brains, the fluid would, through sedimentation, become as free from impurities as said brains were of ideas. What was the use of stirring up things anyhow?

Marvelous to relate there seems, at last, a prospect of a change and a possibility that there will be some action instead of all talk. Under the pressure brought to bear upon the matter by individual protest and by various organizations of this city, other investigations have been made, and it is probable that in the near (more or less) future the method of sand filtration will be used, and water instead of liquid filth will be offered us to drink.

That there is reason for this constant demand for pure water beyond the mere individual distaste for the use of an unpalatable article, can readily be seen by reference to sanitary statistics, particularly in regard to the relation between the spread of disease and the water supply of a place. In a recent article in the *Chatauquan* Dr. Frank J. Thornbury says that every cholera outbreak of the past fifty years has been traced to the use of impure water, and that a single case of typhoid fever, if the excreta be improperly disposed of, is sufficient to contaminate a whole reservoir, lake or river, and endanger the health and lives of thousands of persons. We further quote:

"Strikingly illustrative in this connection is the epidemic which occurred at Plymouth, Pa., in the summer of 1885. The estimated population of the town was 9,000. Of this number 1,104 were attacked with the fever and over ten per cent. of the cases proved fatal, there having occurred in all 114 deaths. The epidemic was traced to a single case of typhoid fever, located upon a hillside up the stream which supplied water to

the reservoir of the town. The dejections were not properly disposed of, and in the spring when the annual thaw came the germs of typhoid fever were carried down the hillside into the stream and then into the reservoir from which the residents received their drinking water.

Water is more apt to be impure in winter than at other seasons, owing to the deficient oxidation of organic matter due to the presence of ice upon the surface. After the ice upon which refuse matter has accumulated during the winter breaks up in the spring, there often occurs a considerable increase in the number of typhoid fever cases in large towns and cities. As to the effect of freezing upon the quality of water—in Lake Zurich bacteriological investigations have revealed the maximum number of germs from November, 1889, to January, 1890, to be 202 per cubic centimeter; from January to March, 2,179; from March to April, 2,152; from April to May, 1,425; in May and June, 229. Water of the Potomac at Washington in January, 1888, contained 3,774; in February, 2,536; in March, 1,210; in April, 1,531; in May, 1,064; in June, 348; in July, 255; in August, 254; in September, 178; in October, 75; in November, 116; in December, 967. Most cities send their sewage absolutely without treatment to mingle with adjacent waters from which the drinking supply is obtained. In other words the citizens seem content to drink complacently water containing raw sewage."

Typhoid fever has for many years been the particular scourge of Philadelphia, and these statements have thus a local interest. The city now derives its water supply from the Delaware and Schuylkill rivers,—94 per cent. from the latter and the balance from the Delaware. Allen Hazen, C.E., of Boston, who has recently investigated the water supply of this city for the Woman's Health Protective Association, with a view to recommending the adoption of a system of sand filtration, says, in the *Journal of the Franklin Institute*:

"An effort is now being made to treat and purify the sewage of Reading before its discharge into the Schuylkill River; but there is no assurance that this treatment as yet is adequate. Aside from Reading, all sewage produced upon the water-shed is discharged directly into the streams.

The water from the Schuylkill for Philadelphia is pumped from two pools formed in the river by dams within the limits of the city. The sewage from portions of the city was formerly discharged into these pools. An intercepting sewer has been constructed, which takes sewage to a point below a dam below the lowest pumping station. The district served by this intercepting sewer is sewered by what is known as the separate system. That is to say, the rain water and sewage are removed by separate systems of carriers, and little, if any, sewage is discharged from the city sewers at any time into the river above the intakes. The river banks above the city limits, and the west side of the river, where the latter forms the boundary, directly opposite the city, are occupied by manufacturing establishments discharging directly into the river. The use of water from the Schuylkill at the present intakes is most objectionable, and the use of water from such a polluted source should be abandoned at the earliest possible moment.

Aside from possible tidal pollution, the Delaware River is much less polluted than the Schuylkill; its flow is greater; its water is softer; it is less subjected to local pollution, and, in every way, it is more desirable as a source of water supply than the Schuylkill; and the same is equally true whether the waters of each are used in their raw condition, as at present, or if each of them should be filtered by equally good systems of filtration."

There can be little doubt that the prevalence of typhoid fever and other zymotic diseases in Philadelphia is attributable directly to the conditions ruling the present water supply, and when the death rate for such diseases is examined, the necessity for action is at once apparent; not only from a human-

itarian standpoint, but also from the economic. It is estimated that there are annually about 400,000 cases of typhoid fever alone in the United States, of which at least 50,000 prove fatal. A conservative estimate of the value of each individual to the State is at least \$1,000, and the cost of each case of fever is about \$200, hence the enormous loss to the nation through the prevalence of disease will readily be seen. When the expense attached to other diseases that may be attributed to impure water is added to this, the estimate will be swollen to enormous proportions, and the necessity for immediate action becomes patent, so that he who runs may read.

The securing of an abundant supply of pure water will be a measure of incalculable benefit, and will mark a greater progression than any step hitherto taken by the government of this city.

Fiftieth Anniversary of the Northern Medical Association, December 5, 1896.

The Northern Medical Association will reach the fiftieth anniversary of its organization December 5, 1896.

With one exception (The College of Physicians of Phila.), it is the oldest medical organization in existence in this city.

At a stated meeting, held September 11th, the motion to celebrate this fiftieth anniversary in a fitting manner was carried and the undersigned committee was appointed to make arrangements for marking this semi-centennial milestone in the path of our professional advancement by a banquet, addresses by the oldest surviving members of the Society and by having a pleasant, shoulder-to-shoulder meeting of the profession in general.

The committee, fully appreciating the just pride to which the Association is entitled because of its years, the laudable work done under its auspices, the eminent men, some of whom are living but in our memory by the good they have left behind them, while others are scattered far and near, but all of whom once took part in its proceedings and

launched their first efforts in scientific medicine before its members, and, above all, that this is a semi-centennial jubilation of a pioneer medical association in the city of Philadelphia, the great medical metropolis of this continent, feel that, in asking the rank and file of the profession to do honor by their presence and give support by their subscription, they ask but of each to do honor to himself, his profession and Philadelphia. Moreover, it is a well-recognized fact that in the routine life of the profession of medicine, each member being the autocrat in his own individual sphere, there is a tendency to an alienation from his colleagues and those progressive principles which are so essential to an accurate acquisition of the sum total of that which enables us to fully represent our duty toward our patients, ourselves and science. To overcome this tendency has always been the aim of The Northern Medical Association in all its transactions. The coming together around the festive board on an occasion for common pride and mutual congratulation, like this, carries with it an unity of purpose that makes us appreciate one another's individual strength, while it mitigates the accredited shortcomings in any common end.

The banquet will be given at the Hotel Walton on the exact anniversary—December 5, 1896—at 8 p.m. The per capita assessment has been fixed at \$5.00. Please send your subscription or cheque to Dr. Updegrave, P. O. B. 2904, Station S, before the last mail of Saturday, November 28th.

DR. S. UPDEGROVE, Treasurer,
DR. S. WOLFE, Secretary,
DR. I. P. STRITTMATTER, Chairman,
Committee.

Cutting Glass With a Layer of Oil.

Pour oil into the bottle until it reaches the level where it is desired to cut off the glass. Then heat a poker in the oven until it glows, and plunge it into the oil. A report follows, and the job is done. At the exact level of the oil the glass is cut off smooth.

This is explained by the fact that bottle glass cannot stand a sudden rise of temperature: under such circumstances it bursts along the line where the temperature is raised.

CORRESPONDENCE.

ANESTHESIA DURING SLEEP.

EDITOR OF THE MEDICAL AND SURGICAL REPORTER :

While there is a paucity of literature or reference in medical writings to the subject of anesthesia during sleep (see Dr. Cleaver's article in *THE MEDICAL AND SURGICAL REPORTER* of October 31, 1896), yet from the few published experiences there is no doubt as to the possibility of its accomplishment. H. C. Wood, in his *Therapeutics and Materia Medica*, says that "experiments made in the Philadelphia Hospital have proven that persons sound asleep may be chloroformed without their being awakened." In *THE REPORTER* of March 5, 1881, is a reference to some experiments made by Dr. Quimby, cited from transactions of American Medical Association, which go to prove the same thing. Also

in *THE REPORTER* of September 18, 1886, is another instance given, but as the subject may have been in a condition of stupor, this particular case is not conclusive.

Several years ago I succeeded in chloroforming a sleeping child three or four years old without awakening it, and afterwards reduced a dislocated shoulder. There is no question in my mind but that healthy children in sound sleep can be chloroformed without being wakened if proper precautions are taken, but there is a probability that more difficulty would be encountered in producing a similar condition in a sleeping adult. Respectfully,

J. W. HUFFMAN.

PRESOTT, IOWA, November 12, 1896.

ABSTRACTS.

CITY AND COUNTRY DOCTORS.*

What are the inducements to the study of medicine? Let us consider the financial aspect of the question first. The easiest and quickest way to a competence is to locate at some country "Corners," out of reach of competition, and where a living may be expected almost from the start. The first year's receipts will be from five to eight hundred dollars; there will be an increase for a year or two, but then comes the limit of ambition, and, although the physician is practically assured of as good a living as most of his neighbors, he is isolated from his natural companions and doomed to a hard routine of long drives over rough roads, often at night, and particularly at the very seasons when the weather is most inclement.

*A. L. Benedict, in *Lippincott's*.

"Doctoring" may pay better than pitching hay, and if the country practitioners represented simply the uneducated young men who study medicine "for what it is worth," our sympathies would be due not to the doctor, but to his patients. Unhappily for the former, and fortunately for the latter, so many good men are forced by circumstances to practice in the country that the standing of country doctors is far higher than their meagre recompense would indicate. There are also undesirable quarters in most cities which afford a paying practice almost from the beginning, but it is difficult for a physician thus located either to grow into a better practice or to save enough to make a fresh start. While the country doctor may console himself with the thought that without

himself, or some one in his place, much suffering would result, the city resident is as needless as he is unfortunate, for his patients could easily send for one of many practitioners within a few blocks. No better advice can be given to a young physician than "Locate where you are willing to live."

"Such a choice of residence, however, involves the ability to meet expenses for two or three, perhaps four or five, years, without relying on a professional income. Several eminently successful physicians have stated their first year's collections at from fifteen dollars to two hundred and fifty.

HOW ANTI-TOXINES ARE DEVELOPED.*

The new treatment of diphtheria is a practical application of the latest advances of experimental bacteriology. The general facts upon which it is based are briefly these: Certain bacteria, when developing in the organism of an animal or man, produce an albuminoid poison called a toxin, which, circulating in the blood, causes disease. For example, the Klebs-Löffler bacillus, growing in the throat of a child, generates a toxin that produces the systemic condition called diphtheria.

If some of these bacteria be removed from the organism and placed in artificial media, such as broth, under proper conditions they will grow and multiply and produce the same toxin as before. This toxin may now be separated from the bacteria by filtration, and if introduced into an organism by inoculation it will produce the disease as readily as if it had been formed in the organism. But the virulence of the disease thus produced will vary with the quantity of the toxin injected. Moreover, if the first dose given is so small as to produce only slight illness, a larger quantity may be introduced a few days later without producing a corresponding effect; and progressively larger doses may be administered from time to time, until at last the animal receives with impunity doses many times larger than could possibly be borne at first.

In the case of the diphtheria toxin for example (obtained, as has been said, by growing the diphtheria bacillus in meat broth), if fifteen drops of the filtrate containing the toxin be injected into a vein of a horse, the animal will be severely poisoned. But by repeating the

injection from time to time in progressing doses, at the end of three or four months the animal will bear a dose of two hundred times the original quantity. In other words, the animal has become immune to the disease.

If now a vein of the immune animal be opened and some blood withdrawn, the serum of that blood (the other constituents being removed) may be injected into the system of another animal or a human being without ill effect, and the animal or human being thus inoculated becomes immune to the disease, in virtue of the inoculation. More than that, if the organism inoculated had already acquired the disease, the inoculation, within reasonable limits, is curative. For example, if a child has been exposed to diphtheria, inoculation with the serum of a horse rendered immune to diphtheria as above described will prevent development of the disease. At a later stage inoculation tends to cure the disease.

These are the facts as applied in the new serum treatment of diphtheria.

Served Him Right.

In the peaceful vale of Lichtenberg,
At the Lion's sign, I think,
I was fain to eat, and ordered meat
And a cup of cooling drink.

Quoth I to the maid with rosy lips
Who brought the welcome cheer,
"A golden coin I'll gladly give
For kiss of thine, my dear."

Quoth she: "Good sir, that ne'er will do.
No man hath kiss of mine.
But if thou wilt I'll kiss thy cup."
She did—then drank my wine.

—From the "Editor's Drawer," in *Harper's Magazine*.

*From *Harper's Weekly*.

PERISCOPE.

Formulee.

HYPODERMATIC PURGATIVE—

℞ Caffeine et chloral āā gr. viiss.
Aque M lxxv.

S. Inject fifteen minims.—*Ewald, Journal de Médecine de Paris.*

ANTIDYSPEPTIC—

℞ Bism. subnit.,
Magnes. sulphat.,
Cret. prepar.,
Calc. phos. āā 10

M. Div. in cachet No. xl. S. One before each meal in dyspepsia accompanied with pains and flatulency.—*Dujardin-Beaumetz.*

ANTI-ASTHMATIC—

℞ Tinct. opii 4
Ether sulphuric 8

M. S. About fifty drops every twenty minutes in attacks of asthma with emphysema.
—*Clymer*

INFANTILE DIARRHEA—

℞ Bism. subgal 3 i.
Sodii bicarb gr. v.
Cret. prep. 3 ss.
Creosoti gtt. v.
Syr. cinnam 3 iv.
Aq. dest q. s. ad 3 iv.

M. S. Teaspoonful after each movement.—*Griffin.*

ABSORBENT POWDER—

℞ Alum, finely pulverized 5
Carbonate of lime, pulverized 4
Starch, pulverized 50
—*Sigmund.*

CUTANEOUS IRRITATION OF MEASLES—

℞ Lanolini puris 3 i.
Vasellini 3 iij.
Ol. ricini m ij.
Aq. dest 3 v.

Ft. ung. S. Apply as required.—*Practitioner.*

TOOTHACHE—

℞ Chloral hydrate,
Camphor,
Carbolic acid,
Glycerin āā 3 iss.

Introduce into tooth cavity a ball of cotton moistened with this mixture.

EARACHE—

℞ Chloral hydrate,
Camphor,
Carbolic acid āā gr. xiiss.
Castor oil 3 iv.

Warm the mixture and put a few drops in the ear.—*College and Clinical Recorder.*

EPILEPSY—

℞ Antipyrin 3 i.
Ammonium bromid 3 iiss.
Strontium bromid 3 i.
Solution of potassium arsenite m xl.
Extract of solanum carolinense 3 xss.
Water q. s. ad 3 vi.

M. Dose. A dessertspoonful or more twice daily.—*Gaz. hebdom. de Méd. et de Chir., 1896, No. 19.*

OBESITY—

1. Ex. fucus vesiculosus 8 fl. ozs.
Sig.—Tablespoonful three times a day.—*Chapman.*
2. Potassa permanganat 4-16 grs.
Aque 4 fl. ozs.

M. Sig.—Dessertspoonful three times daily.—*Bartholow.*

4. Ammon brom 2 drs.
Aque 8 fl. ozs.

M. Sig.—Dessertspoonful three times a day, well diluted.—*Tanner.*

FOR CORNS—

Painted on the corn night and morning for several days, when the corn will, as a rule, come readily away:—

℞ Acid. salicylici 30 grs.
Ex. cannabis ind 10 grs.
Collodii 4 fl. drs.

M. —*Medical Record.*

CHRONIC DIARRHEA AND DYSENTERY—

℞ Cupri sulphat,
Morphine sulphat āā 1 gr.
Quiniae sulphat 24 grs.

M. ft. pil. No. xii.

Sig.—One pill three times a day.—*Med. Bulletin.*

FEVER BLISTERS—

℞ Camphor 5 grs.
Arrowroot, powdered 30 grs.
Bismuth subnitrate 30 grs.
Cold cream 4 drs.

M.

NEWS AND MISCELLANY.

The regular meeting of the section on pathology of the Buffalo Academy of Medicine was held November 17. Dr. H. Mynter discussed the "Pathology of Appendicitis."

The management of the Journal of Nervous and Mental Disease, announces the following arrangement of the staff for 1897: Editors, Dr. Charles L. Dana, Dr. F. X. Dercum, Dr. Philip Coombs Knapp, Dr. M. Allen Starr, Dr. Charles K. Mills, Dr. James J. Putnam, Dr. B. Sachs; Associate Editors, Dr. Philip Meirowitz, Dr. William G. Spiller; Managing Editor, Dr. Charles Henry Brown.

For local treatment of gout take half an ounce of iodide of potassium, dissolve it in half a pint of rectified spirit—methylated spirit is used in hospital practice—add one ounce of soap liniment, and then one-half drachm each of oil of cajeput and oil of cloves. A piece of lint is soaked in this mixture, wrapped round the affected part, covered with a protective, and kept in place by a bandage. Dr. William Murrell (*Lancet*) says this acts as a powerful counter-irritant, and the inflammation usually subsides in from twelve to twenty-four hours. In addition, I not uncommonly give a drachm of colchicum wine with ten grains of iodide of potassium three times a day. These large doses of colchicum wine induce brisk purgation, sometimes accompanied by vomiting, but they speedily cut short the attack. This mode of treatment is especially useful in the case of robust, full-bodied men in active employment, to whom the loss of a day's work is a serious consideration. In sciatica, lumbago and rheumatism affecting one joint the local application of a liniment containing half an ounce of salicylate of sodium, half a drachm of oil of cajeput, fifteen minims of oil of eucalyptus, and half an ounce of soap liniment in six ounces of rectified spirit affords prompt relief.

The following causes for chronic constipation are given by Dr. James D. Staple, in the *Medical Times*: (1) Lack of tone in the muscular coat of the intestines, causing a decrease in peristalsis, usually due to imperfect regional innervation. (2) Deficient secretion or excessive absorption. People leading sedentary lives are predisposed to constipation. The symptoms (excepting in those cases due to organic disease) are loss of appetite, imperfect indigestion, nausea, headache, irritability, mental depression, bad complexion, acne, sleeplessness. Hysteria in the female and hypochondria in the male have been often caused by constipation, and it is even stated that a condition of disease bordering upon insanity may be brought about by a long-continued defective formation of feces and imperfect action of the bowel. Moreover, the material which should have been removed will accumulate in

the blood, and in consequence such diseases as gout, rheumatism, etc., may be developed. The treatment may be divided into (1) non-medicinal, and (2) medicinal. Under the non-medicinal we may include: (a) correction of diet; (b) fluids before breakfast; (c) exercise; (d) cold bath or rubbing the body with a rough towel; (e) kneading the abdomen; (f) going to stool at a regular set time. In the medicinal treatment of chronic constipation the giving of purgatives should be avoided, the reason being that patients acquire the habit of depending on them. Small glycerin suppositories are highly recommended, being rapid and certain in action and their use unattended with griping or irritation of the gastro-intestinal tract. In cases in which aperients must be given, cascara sagrada is recommended, but even in these cases it is well to begin with some natural mineral water.

A Contribution to the Pharmacology of Thyroiodin.—As the result of an experimental investigation, Hildebrandt (*Berliner Klinische Wochenschrift*, 1896, No. 37, p. 826) has found that thyroiodin, an organic substance insoluble from the thyroid gland, is capable, when injected subcutaneously, of preventing in dogs the development of the symptoms that follow complete extirpation of the thyroid gland and in keeping the animals alive. The substance probably represents the active principle of the gland. The albuminuria and the glycosuria that usually follow thyroidectomy in dogs are also prevented by injection of thyroiodin. Neither iodine nor its salts are capable of inducing similar effects.

The American Association of Obstetricians and Gynecologists, at its ninth annual meeting, held at Richmond, Va., elected the following officers for the ensuing year: President, James F. W. Ross, M.D., Toronto; Vice-Presidents, George Ben Johnston, M.D., Richmond, and John C. Sexton, M.D., Rushville, Ind.; Secretary, William Warren Potter, M.D., Buffalo; Treasurer, Xavier O. Werder, M.D., Pittsburg; Executive Council, Charles A. L. Reed, M.D., Cincinnati; Lewis S. McMurtry, M.D., Louisville; A. Vanderveer, M.D., Albany; J. Henry Carstens, M.D., Detroit, and William E. B. Davis, M.D., Birmingham. The next annual meeting was appointed to be held at the Cataract House, Niagara Falls, N. Y., August 17, 18, 19 and 20, 1897.

Digestive Disturbances in Infants.—The multitude of infant foods in the market and the numerous methods proposed from time to time to assimilate cow's milk as closely as possible to human milk, illustrate most forcibly the difficulties still encountered in the artificial feeding of infants. The chief objection to pure cow's milk is that its casein curdles thick, firm masses, which are not readily digested, and are apt to overtax the gastric

functions. On the other hand, diluting the milk, the best means of obviating this is equivalent to diminishing its nutritive value and the larger quantity that must be given to compensate for this is apt to exert a deleterious influence. If, however, the milk receives an addition of albuminous material, equal or superior to casein in nourishing properties, it can then be diluted to the proper degree, so that its casein will no longer coagulate into indigestible curds. Dr. H. Wolf, assistant to the Pediatric Clinic of Prof. Monti, of Vienna, states that this can best be accomplished by the addition of somatose, a food product consisting of the albumoses of meat in a concentrated, soluble, readily-assimilable form. He reports 35 cases of children suffering from gastro-intestinal complaints, in which this somatose milk exerted remarkably beneficial effects upon the local trouble and the general condition of the patient in almost every instance. During its use there was a progressive gain in weight, the dyspeptic disturbances and restlessness ceased, and the stools became of normal color and consistence. Coincidentally with this gain in flesh the anemia subsided, as was demonstrated by an increased number of red-blood corpuscles. The digestive disturbances of older children were also favorably influenced by somatose. On the ground of his experience, Dr. Wolf therefore considers himself justified in concluding: first, that by addition of somatose to cow's milk it is rendered more digestible; second, that by its administration to infants the milder forms of dyspepsia are improved; third, that somatose milk is well tolerated by children suffering from marasmus, and fourth, that in functional disturbances of the digestive tract in older children excellent results are derived from the administration of somatose. In view of the fact that in the 35 cases recorded this preparation was employed exclusively without resorting to medicinal agents, Dr. Wolf's observations are entitled to the most careful consideration.

The treatment of carbuncle with zinc chlorid, boric acid and iodoform, has proved successful according to Asst. Surg. P. Victor, in the *Indian Medical Record*. The patient, a man forty-five years old, suffered from a huge carbuncle on his back; it measured twelve inches in length and seven inches in width. There was oozing of pus from several small openings. As the patient was too weak and exhausted, and had a temperature of 102° F.,

the author refrained from placing him under the influence of chloroform at once, and making a free incision and scraping. He therefore ordered a large carbon poultice to be applied every four hours, which broke down the skin and showed a very large gaping wound with sloughs in abundance. The wound was thoroughly washed with antiseptic lotion, and the entire surface brushed with a solution containing four grains of zinc chlorid to an ounce of water. It was then dusted with equal parts of boric acid and iodoform, and dressed with antiseptic gauze. As the discharge was very profuse, the dressings became saturated, so the carbuncle was dressed daily and brushed with the zinc chlorid solution every second day. On the eighth day the fever abated, and on the ninth day the wound was clear of all sloughs, and looked healthy and granulating.

The October (quarterly) meeting of the Medico-Legal Society of Philadelphia, was held on the 27th, Dr. A. B. Hirsh, the president, in the chair, and was characterized particularly by the importance of the subject of the evening's lecture. About fifty persons attended and, after election to membership of Drs. George Y. MacCracken and Victor G. R. J. Rehm, some twenty new members were proposed. The Society's guest of the evening was Dr. B. Meade Bolton, the chief bacteriologist of the city, who has just been called to the professorship of Pathology and Bacteriology in the University of Missouri. In an able paper (shortly to appear in the *Popular Science Monthly*) entitled: "Are the Bacteria Probably Employed in the Commission of Crime?" he held the full interest of the assemblage. Going over many recently ascertained details cognate to the subject, he showed that the cold scientific facts would not permit of any sensational or actual employment of bacteria in the performance of criminal deeds. The thanks of the Society were voted Prof. Bolton, and he was entertained at dinner by the members.

Owing to the widespread use of camphor in the arts and medicine, its increasing scarcity and consequent expensiveness have raised the question of artificial cultivation. Dr. E. Grassmann urges the importance of increasing the plantations to the greatest possible extent, and placing some restriction on the wanton destruction of the trees.